DEPARTMENT OF TECHNOLOGY SERVICES

Data Center Consolidation

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A data deduplication and VTL solution will be purchased and in production shortly, allowing for many of the backups to reside on disk instead of tape. (more information about this in the following article)

Software and or consulting services are being considered to assist in the transfer of VMs that already exist at the campus. Such software would allow for VMs to be replicated from the campus to the SLDC without severely impacting WAN traffic, as the software allows for the sys admin to determine how much bandwidth they wish to consume. When the system administrator is ready to convert to the migrated system, he takes the local VM instance offline and brings the migrated VM online, thus shortening the downtime of the migration. This software will offer one more option to the system administrators as they prepare to migrate systems.

Two VM consultants have been brought in to help with the virtualization process at Campus D and the SLDC. DTS staff at Campus D had high praise for their consultant saying they were a "valuable resource" in the process.

The Salt Lake Data Center

TSM (Tivoli Storage Management)

IBM Tivoli Software is a suite of system management products. DTS makes use of IBM Tivoli Storage Manager or TSM, within this software suite. TSM is used to provide backup/archive, restore/retrieve, and a level of disaster recovery protection for data that resides under the DTS umbrella.

The consolidation project has identified the need for upgrades in numerous areas. One of these is our current TSM environment. We have two TSM backup servers, one in our Salt Lake data center and one in Richfield. Most of the clients (servers backing up to TSM) exist in Salt Lake. However, half of the Salt Lake clients are being backed up to Richfield. The Richfield TSM server then creates additional copies coming back to Salt Lake.

It is our intent to stand up a new environment to accommodate new clients from the consolidation effort, and gradually migrate present TSM clients from the existing environment to the new TSM environment. Our new implementation will consist of clients backing up to multiple TSM servers in Salt Lake, and one in Richfield. These TSM servers will stream data to a DD880 Data Domain disk storage appliance in each of the respective locations. This appliance is capable of deduplicating data and emulating a tape library. There are many advantages to deduplication, three of them are particularly noteworthy. 1. Data is both backed up and restored locally. 2. Both backups and restores will occur much faster then with the current system 3. All backups will be duplicated off-site (Salt Lake to Richfield or the inverse) with only deduplicated data traversing the Wide Area Network, thus freeing up bandwidth for other applications.

This solution will bring a true enterprise Backup/Archive and Disaster Recovery infrastructure to our customers and enable them to benefit from the latest technological advances.

Project Status

Virtualized but waiting to move	**225**
Servers completed	**510**
Data Centers Completed	**9**
Completed % of work	**27**
Physical Servers (Final Count)	**TBD**

Data Center Consolidation Project Objectives

- Consolidate from 34 Data Centers to 2 Data Centers
- Save $4 million in ongoing costs
- Reduce physical server counts from 1700 to 400 or less
- Create a true enterprise infrastructure environment

SUN 9990V located in the SLDC

Campus A Update

With SAN Storage in place at the SLDC – work at Campus "A" is starting to move forward. Our most recent project involved moving the Dept of Commerce servers to the SLDC over the past two weekends. Some problems were found due to older version of ZENworks. To help with the move and solve some log in issues, the new ZENworks 10 client was loaded at Commerce. The final server for the Labor Commission will be moved the week of Dec 7 to 13. All servers for three different data centers will be at the SLDC by the middle of December. This will leave only the DWS Main data center as the only one remaining in Campus A.

Planning and consideration reviews are underway for the major application moves occurring over the next couple of months.

Campus B Update

"Currently there are 43 servers that are now located at the Salt Lake Data Center."

The consolidation of the servers for the DHS Administration Building began in November of last year, 2008. The physical move of all the servers from the DHS Administration building to the Salt Lake data center was completed by September 29, 2009.

Included in this move were NetWare servers, Windows servers, Linux servers and HPUX Unix servers. There were initially 58 physical and virtual servers that needed to be moved. Currently there are 43 servers that are now located at the Salt Lake Data Center.

The ORS servers from the HK building have also been consolidated and moved to the Salt Lake Data Center. This move involved a total of 14 servers. Having completed the physical move of the servers, virtualization has begun and is nearing completion.

Other sites within Campus B that are being consolidated are Tax, DEQ and DCC. There are a total of 146 servers for these sites combined.

The Utah State Hospital (USH) and Utah State Developmental Center (USDC) are also being consolidated by Campus B. There are 18 servers for these two sites combined.

Campus C Update

"The project goal for the campus is to have all remaining servers that will be moved to the Salt Lake Datacenter converted to virtual machines by December 31, 2009."

Since the beginning of the Datacenter Consolidation Project, Campus C has hosted approximately 249 servers located at the Calvin Rampton, UDOT Traffic Operations Center, UDOT Region 2 Headquarters, and the DPS P.O.S.T datacenters. 35 of the servers at the UDOT Traffic Operations Center have been identified as exclusions from the project due to infrastructure requirements related to the UDOT Advanced Traffic Management System (ATMS). About 75 other servers have been identified as potentially going away by the project deadline due to consolidation efforts or other reasons.

During September and October, UDOT application performance benchmarks were created and recorded. Most of the server performance metrics have been collected. The network architecture plan is complete. The project goal for the campus is to have all remaining servers that will be moved to the Salt Lake Datacenter converted to virtual machines by December 31, 2009. At this point in time, 79 servers are running as virtual servers and are waiting to be migrated.

The migration strategy for Campus C is to maintain existing network configurations as much as possible and migrate entire server IP subnets simultaneously. For the most part, physical hardware hosting servers for each IP subnet will be moved all at once, while network routes are changed on the state Wide Area Network (WAN). Once the hardware is in place at the Salt Lake Datacenter, servers will be brought up with their original network configurations and should be available for use, minimizing downtime. Virtual servers will then be migrated during the following days to the new infrastructure at the Salt Lake Datacenter.